MANAGEMENT OF INVASIVE ALIEN PLANTS ALONG ROADSIDES

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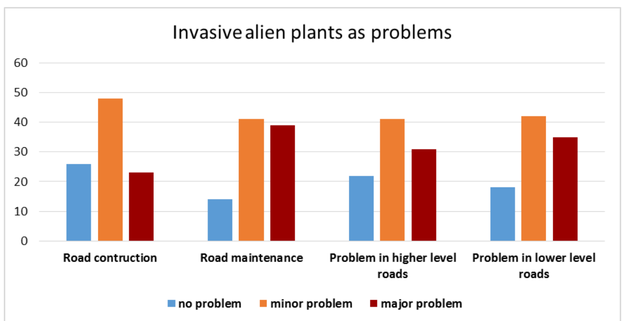
Roads play a profound role in the spread of invasive alien plant species (IAPs) by serving as corridor for the movement as well as providing habitat for establishment. Transport infrastructure habitats are characterized by harsh growth conditions in regards to soil fertility, sunlight and abiotic stress factors like drought and salt. Infested roads verges are often the starting point for the spread into adjacent land. Once IAPs are established on road sites they displace native vegetation. Many road construction and maintenance activities have the potential to introduce or spread IAPs.

Within the ControlInroad project we:

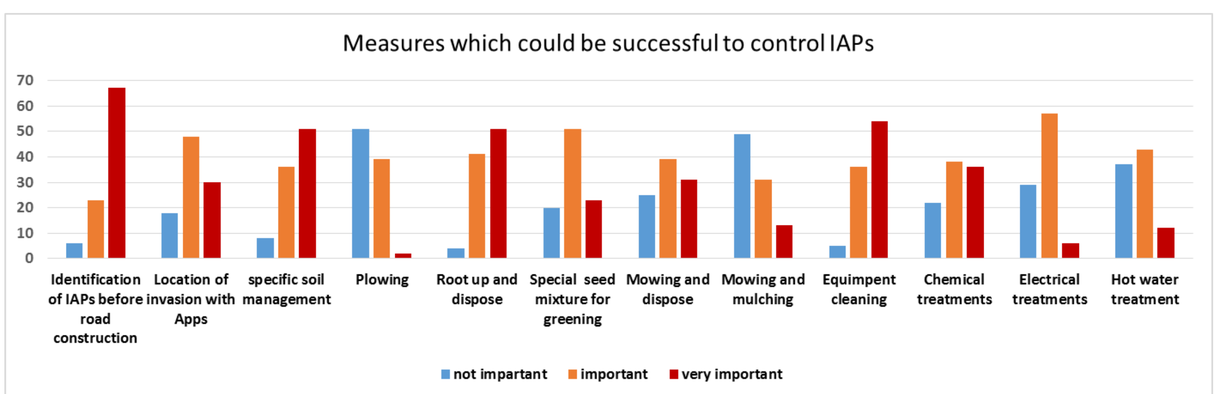
1. **Compile a list of IAPs spreading alongside roads for selected European countries**
2. **Evaluate new methods for IAP management**
3. **Develop a best practice guide for road construction and maintenance**
4. **Apply a cost-benefit analysis for best practice**

Questionnaire outcome (101 answers):

A questionnaire was send out to European road authorities to investigate the present awareness of IAPs



IAPs are seen as a problem in road maintenance both on higher level and lower level roads. The problem of IAPs in road construction is seen by the majority as no problem or minor problem.



Most participants indicated the identification of the problematic plants could be important in controlling IAPs. Hot water, mowing and mulching is seen as less effective, whereas equipment cleaning, soil management and root pulling is seen as very important measures in regards to the control.

Most frequently mentioned invasive alien plants along roadsides in each country based on the literature and personal interviews

Species	Country						
	AT	DE	NL	IR	NO	SE	SI
Impatiens glandulifera*	x	x	x	x	x	x	x
Fallopia japonica	x	x	x	x	x	x	x
Heracleum mantegazzianum*	x	x	x	x	x	x	
Fallopia sachalinensis	x	x	x	x	x		x
Fallopia x bohemica	x	x	x	x	x		x
Solidago gigantea	x	x	x		x	x	x
Solidago canadensis	x	x	x		x	x	x
Senecio inaequidens	x	x	x		x	x	x
Ambrosia artemisiifolia	x	x	x				x
Ailanthus altissima	x	x	x				x
Lupinus polyphyllus		x			x	x	x
Epilobium ciliatum		x			x	x	x
Rosa rugosa		x	x		x	x	

More information of www.controlinroad.org

* species are on the list of Alien Species of Union concern (EU regulation 1143/2014)

Different methods in vegetation management and their mode of action

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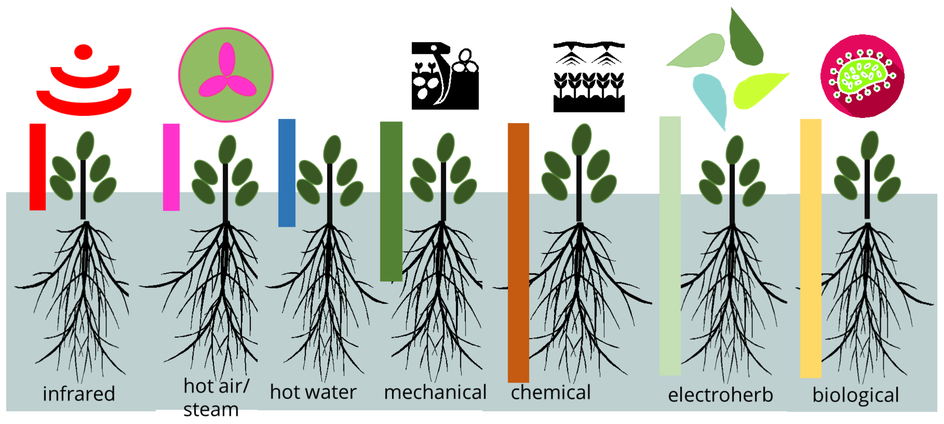


Most of the alternative methods target only the upper part of the plants. Perennial plants with deep root system and rhizomes will regrow. Chemicals are able to penetrate the plant and damage also roots and root systems . Electric high voltage reaches the root systems when applied on the upper plant part. The method is still under development. Biological control with microorganism can reach the roots system and is the only method, beside some herbicides, which can also effect seed germination.

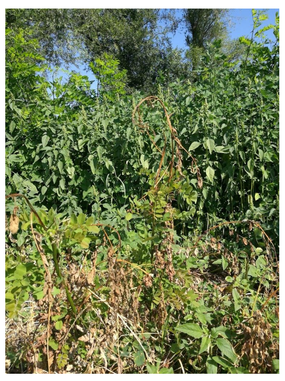
Most of the alternative methods until now are not as effective as chemicals. To reach similar results it is estimated that the costs are about 50 times higher compared to herbicides (Young 2004 doi:10.1614/WT-03-094R3).

Non chemical treatment to control IAPs using electric high voltage.

In many European countries the use of herbicides is prohibited on road verges based on national legislation. Alternative cost efficient methods are needed. Within the project the use of electric high voltage was tested in regards to the control of IAPs. We tested the method developed by Zasso on Japanese knotweed, robinia and ragweed.

The development of Japanese knotweed treated with electric high voltage after two weeks The left plant is untreated, the middle and right plant are treated. The development of new shoots from the rhizomes is slower due to the treatment.

The treatment of small robinia plants was successful, but bigger plants developed new shoots from the basis already after two weeks. The tests will be continued



Ragweed location, a) before, b) directly after and c) two weeks after the treatment with electric power.

The control of ragweed by mowing is difficult due to the re-sprouting of the plants. With the Electroherb method it was tested if the plants can re-sprout and form new stems which are able to produce flowers. By passing the electric applicators directly through the plants, the plants dry out and die, but also non-target plants may be affected, if the get in contact with the applicators. If the treatment is to early in the season new plants may grow from seeds again. To avoid both, height selective applicators can be used when ragweed is higher than the surrounding preferred vegetation. Thus, the treatment time should be best when the plants are nearly fully grown before pollen production.

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